

include an exhaustive meteorological record for each day of 1903, and particulars of the field work in which the members of the society engaged during the session under review.

THE first two volumes of Mr. Herbert Paul's "History of Modern England"—which is to be completed in five volumes—have been published by Messrs. Macmillan and Co., Ltd., at 8s. 6d. net each. The first volume deals with the events of the years 1846–1855, and the second carries the history as far as 1865. We propose to review Mr. Paul's work when the third volume has been published, but we take this early opportunity of expressing our satisfaction that—following the example of John Richard Green—Mr. Paul records the work done in science in this country during the years with which he is concerned.

A SECOND edition of a "Manual and Dictionary of the Flowering Plants and Ferns," by Mr. J. C. Willis, has been published at the Cambridge University Press. In this edition the two parts of the original work are combined into one volume, while part i. is shortened by the omission of controversial matter, and by the use of smaller type for paragraphs of descriptive terms and other articles not intended for consecutive reading.

In the Paris *Comptes rendus* for February 1 Messrs. Sabatier and Mailhe describe a method for the reduction of aromatic halogen derivatives by subjecting the vapours mixed with excess of hydrogen to the action of finely divided nickel at a temperature of about 270° C. In these circumstances considerable yields of benzene are obtainable from monochloro- and dichloro-benzene. Similarly toluene is easily obtained from the chlorinated toluenes, and trichlorophenol gives considerable quantities of carbolic acid. With bromine derivatives the reaction proceeds similarly, but not quite so readily as in the case of the chlorine substitution products.

It is well known that the requirements of the fundamental law of mass action when applied to the electrolytic dissociation of salts, strong acids and bases are not satisfied, and in recent years many attempts have been made to account for this fact. In the Jubelband of the *Zeitschrift für physikalische Chemie*, Prof. Rothmund attributes this to the incorrectness of the values for the degree of dissociation obtained by the usual conductivity and cryoscopic methods. A new method of obtaining the extent of dissociation is developed, and the author shows that in the case of the fairly strong picric acid the values so obtained are in agreement with the mass action law.

THE additions to the Zoological Society's Gardens during the past week include two Two-spotted Paradoxures (*Nandinia binotata*) from West Africa, presented by Mr. A. W. V. Crawley; a Common Paradoxure (*Paradoxurus niger*) from India, presented by Captain Robin; two Asiatic Deer (*Cervus asiaticus*) from Central Asia, presented by H.G. the Duke of Bedford, K.G.; three Hedgehogs (*Erinaceus europaea*), British, presented by Mr. M. Yearsley; a Hairy-footed Jerboa (*Dipus hirtipes*) from North-east Africa, presented by Mr. G. C. Kennedy; a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, presented by Mrs. Payne; a Ring-necked Parakeet (*Palaeornis torquatus*) from India, a Rose-crested Cockatoo (*Cacatua moluccensis*) from Moluccas, a Chilodon's Snake (*Lialis childroni*) from Madagascar, deposited; a Kiang (*Equus hemionus*) from Tibet, purchased; a Sonnerat's Jungle Fowl (*Gallus sonnerati*) from Southern India; a Golden-bellied Grosbeak (*Pheucticus auriventris*) from Argentina, received in exchange.

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### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN MARCH:—

Mar. 7. 16h. Venus in conjunction with Saturn. Venus of 20' N.  
 8. 12h. Ceres in conjunction with the moon. Ceres 0° 29' S.  
 16. 17h. 45m. Annular eclipse of the sun invisible at Greenwich.  
 18. 8h. 56m. Minimum of Algol ( $\beta$  Persei).  
 20. 13h. Sun enters the sign Aries. Spring commences.  
 21. 5h. 45m. Minimum of Algol ( $\beta$  Persei).  
 22. 10h. 0m. to 10h. 41m. Moon occults θ Tauri (Mag. 3·9).  
 25 9h. 2m. to 10h. 11m. Moon occults λ Geminorum (Mag. 3·6).  
 26. 22h. Jupiter in conjunction with Sun.

VARIABILITY OF MINOR PLANETS.—In *Circular* No. 75 of the Harvard College Observatory Prof. Pickering publishes and discusses the results of Prof. Wendell's observations of the minor planet Iris (7). The planet's magnitude was compared with several B.D. stars, and a variation, having a period of about 6h. 13m. and a range of about two- or three-tenths of a magnitude, was established. This variation closely resembles that of Eros, and the conditions for that planet, as discussed in *Circular* No. 58, are also applicable in the present case.

Prof. Pickering suggests that both Eros, which is now approaching its second stationary point, and Iris should be carefully watched.

*Circular* No. 64 from the Kiel Centralstelle announces that on February 16 Prof. Paliser discovered a decided variation in the magnitude of the minor planet Hertha (135), having a range of 0·5 mag., from 10·0 to 10·5. The following ephemeris is abstracted from one calculated by Dr. Neugebauer for 12h. Berlin M.T.:—

1904	a	δ	log Δ
Feb. 29 ...	9 29 30	... +15 58·3	... 0·2948
Mar. 2 ...	9 27 48	... +16 4·9	
,, 4 ...	9 26 9	... +16 11·2	
,, 6 ...	9 24 34	... +16 17·1	
,, 8 ...	9 23 4	... +16 22·5	... 0·3047
R.A. ±1m. Dec. = ±5·2.			

OBSERVATIONS OF VENUS DURING 1903.—In *Bulletin* No. 6 of the Lowell Observatory, Mr. Percival Lowell describes and discusses the objective reality of the markings seen by him on the surface of Venus during 1903. In the first place he discusses the possibilities of illusion on the part of the observer in seeing such faint details, but he has arrived at the conclusion that there are two kinds of real markings on this planet's surface. The first class includes the nicks running in from the terminator, the collar round the South Pole, and the two spots, Asteroth and Ashera, upon it. Of these Mr. Lowell has no doubts as to their reality, and from his observations of them he is assured that the period of rotation of the planet is 225 days. The second class of markings includes the long shades, such as Anchises regio and Hero regio, which, commencing at the terminator, run towards the centre of the disc. It is more difficult to confirm the objective reality of these markings, although from the permanence of their observed positions Mr. Lowell concludes that they are real features of the planet's surface. Measurements of the position angle, from the cusp, of the tip of Paris regio on the limb, when the longitude of the centre of the disc was between 75° and 86°, gave as a mean of sixteen measures on eight nights 10° 6'. The position angle of the tip of a marking to the left of this was determined as 27° 1'.

Mr. Lowell strongly insists upon the fact that the appearance of these markings is in no sense "canaliform"; they are not regular, nor of even width, nor dark or sharply defined, are never doubled, and they do not form a system of interlacing lines as do the "canals" of Mars. Four drawings of the planet's disc at different times are reproduced in the *Bulletin*, and a comparison of two of these made on April 14, 1903, with an interval of nearly six hours between the two observations, shows no change in the positions of the markings, thus indicating that in that interval the effects of the planet's rotation were imperceptible.

CATALOGUE OF NEW DOUBLE STARS.—Prof. R. G. Aitken has just published, in No. 50 of the Lick Observatory *Bulletins*, a sixth list of new double stars discovered by him during the systematic search he has prosecuted since 1899. The present list contains 216 new pairs, none of which appear in Prof. Burnham's General Catalogue. These doubles were discovered with the 36-inch and 12-inch refractors, 61 of them—several of which are separated by less than 0".25—being credited to the smaller instrument. About 30 per cent. of the included stars have distances under 0".50, 50 per cent. under 1", and in more than 72 per cent. the distance of separation is less than 2". The numbers assigned to the stars in the present list are in continuation of those in the former lists, and the star places are given for the epoch of 1900.

#### NOTES ON THE HISTORY OF THE METRICAL MEASURES AND WEIGHTS.

A TRADITION exists in this country that towards the end of the eighteenth century the French Government invited the English Government to cooperate in forming a joint committee for the measurement of the seconds pendulum at the latitude of 45°, which was to be used as a standard of length, and from this length a universal system of measures and weights was to be derived; the English Government having declined to accede to the request, the French savants took the matter in hand and devised the metre and its derivatives. Although this tradition existed, it did not appear to be easy to obtain documentary evidence with regard to it, and it was quite natural that Mr. Alexander Siemens, who was interested in the subject, should apply to the Royal Society in the expectation that some record of the transaction would be found in the minutes of council; these were searched, but without result.

Hearing accidentally of the application, I thought that I could at once place my hand on a reference that would settle the question, but found myself mistaken, so I concluded that I must have heard the statement made by one of my former professors, Hofmann or Frankland.

Having succeeded ultimately in tracing the early history of the negotiations and allied matters, it is possible that the following notes may be not without interest.

Inquiries amongst several friends being without avail, it struck me that there might be some record at the Foreign Office that would throw light on the subject; I therefore wrote to Lord Cranborne, then Under Secretary for Foreign Affairs, asking if the index of their foreign correspondence mentioned the matter. He replied that the correspondence was not indexed, and that it was now at the Record Office; he was also good enough to obtain for me a permit to search the original documents. Before I had proceeded very far in the search, Dr. R. T. Glazebrook suggested a reference to the book by Méchain and Delambre, "Base du Système métrique Décimal," Paris, 1806. In the introduction, or "Discours préliminaire," there occurs on p. 14 an extract from a decree of the National Assembly asking the King to write to His Britannic Majesty requesting him to submit the decree of the National Assembly to the English Parliament.

In vol. xxxiv. of the *Foreign Office French Correspondence*, January to June, 1790, at the Record Office, is a letter from the French Ambassador in England, the Marquis de la Luzerne, enclosing a copy of the decree of the National Assembly to the Duke of Leeds, the Secretary of State for Foreign Affairs.<sup>1</sup>

*The Marquis de la Luzerne to the Duke of Leeds.*

"Portman Square le 22 Mai, 1790.

"Le M<sup>me</sup> de la Luzerne a l'honneur de faire bien des compliments à Monsieur le Duc de Leeds et se conforme aux ordres de sa Cour en lui envoyant ci-joint la copie d'un décret de l'Assemblée Nationale concernant les poids et mesures. Ces ordres lui prescrivent de faire au Ministère de sa Majesté Britannique les demandes qui y sont indiquées, et de l'assurer que le Roi son Maître verra avec

<sup>1</sup> The orthography and the accentuation of the original documents are here followed.

satisfaction que Sa Majesté Britannique les juge de nature à être prises en considération.

"Décret de l'Assemblée Nationale du 8 Mai, 1790.

"L'Assemblée Nationale désirant faire jouir à jamais la France entière de l'avantage qui doit résulter de l'uniformité des poids et mesures, et voulant que les rapports des anciennes mesures avec les nouvelles soient clairement déterminés et facilement saisis, décrète que Sa Majesté sera suppliée de donner des ordres aux administrateurs des divers départemens du Royaume, à fin qu'elles se procurent et qu'elles se fassent remettre par chacune des Municipalités comprises dans chaque département, et qu'elles envoyent à Paris, pour être remis au secrétaire de l'Académie des Sciences, un modèle parfaitement exact des différents poids et des mesures élémentaires qui y sont en usage.

"Décreté ensuite que le Roi sera également supplié d'écrire à Sa Majesté Britannique, et de la prier d'engager le Parlement d'Angleterre à concourir avec l'Assemblée Nationale à la fixation de l'unité naturelle de mesures et de poids : Qu'en conséquence, sous les auspices des deux nations, des commissaires de l'Académie des Sciences de Paris pourront se réunir en nombre égal avec des Membres choisis de la Société Royale de Londres, dans le lieu qui sera jugé respectivement le plus convenable, pour déterminer à la latitude de quarante cinq degrés, ou toute autre latitude qui pourrait être préférée, la longueur du pendule, et en déduire un modèle invariable pour toutes les mesures et pour les poids ; Qu'après cette opération faite avec toute la solemnité nécessaire, Sa Majesté sera suppliée de charger l'Académie des Sciences, de fixer avec précision pour chaque municipalité du Royaume, les rapports de leurs anciens poids et mesures avec le nouveau modèle, et de composer ensuite pour l'usage de ces municipalités des livres usuels et élémentaires où seront indiquées avec clarté toutes ces proportions.

"Décrète en outre que ces livres élémentaires seront addressés à la fois dans toutes les municipalités pour y être repandues et distribuées ; Qu'en même tems il sera envoyé à chaque municipalité un certain nombre de nouveaux poids et mesures, lesquels seront délivrés gratuitement par elles à ceux que ce changement constitueroit dans les dépenses trop fortes : Enfin que six Mois seulement après cet envoi, les anciennes mesures seront abolies et remplacées par les nouvelles.

"Collationnée à l'original par nous Président et Secrétaire de l'Assemblée Nationale à Paris le 9 Mai 1790. Signé Gouttes, curé d'Argillières, Président, L'Abbé Collaud de la Salrette, de Champeaux Palame, Le Cte de Crillon, Chabron, de la Revellière, de l'épaux, et de fermon, Secrétaires."

It will be observed that this decree does not specifically state that a new standard is to be introduced, but that the existing standards are to be corrected by one that has been compared with the length of the seconds pendulum.

Delambre states (*loc. cit.*) that the above decree was sanctioned on August 22, and that the Academy of Sciences nominated a commission consisting of MM. Borda, Lagrange, Laplace, Monge and Condorcet. He does not say that any reply was received from the English Government, and there is not any mention in the papers at the Record Office before the end of August that any reply had been sent.

It was considered probable that the reply, if any, might have been forwarded through the French Ambassador without having been recorded at the Foreign Office, or that the draft of the letter might have been lost. Sir Eric Barrington, Private Secretary to the Marquess of Lansdowne, very obligingly obtained, through the British Embassy at Paris, a copy of a letter from the Duke of Leeds to the Marquis de la Luzerne, dated December 3, 1790. On further search the draft of this letter was found in vol. xxxv. of the *Foreign Office French Correspondence*, July to December, 1790, at the Record Office, together with the note from the Marquis de la Luzerne reminding the Duke of Leeds of his letter of May 22.

*The Marquis de la Luzerne to the Duke of Leeds.*

"M. De la Luzerne a l'honneur de faire bien des compliments à Monsieur le Duc de Leeds et de lui rappeler qu'il a eu cetui de lui addresser, Le 22 mai dernier, par ordre